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EXAMINER	
FLANAGAN, KRISTA M	

ART UNIT	PAPER NUMBER
2817	

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

SM

Office Action Summary	Application No.	Applicant(s)	
	09/915,921	PICKERING ET AL.	
	Examiner	Art Unit	
	Krista M. Flanagan	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20,28 and 29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20, 28 and 29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claims 2, 15, 19, 28 and 29 are objected to because of the following informalities:

a. Regarding claim 2, it is in improper form because a claim should not have dependency upon itself. Examiner believes the claim should depend from claim 1.

b. Regarding claim 15, 19, 28 and 29, per the preliminary amendment filed on 25 July 2001, changes were made to the claim dependency. Per the current amendment filed on 2 March 2005, all changes from the preliminary amendment have been omitted and the original claim has been reinstated with additional changes. The preliminary amendment's omitted information has been added back into the claims without and underlining to particularly point out the amended information. This is improper. Appropriate correction is required.

Oath/Declaration

In view of the amendment filed on 03/02/2005, the Examiner withdraws objections to the declaration from the previous Office Action.

Specification

In view of the amendment filed on 03/02/2005, the Examiner withdraws objections to the specification from the previous Office Action.

Claim Objections

In view of the amendment filed on 03/02/2005, the Examiner withdraws claim objections of claims 1, 3-7, 13, and 16 of the previous Office Action.

Response to Arguments

Applicant's arguments filed on 03/02/2005 have been fully considered but they are not persuasive.

The Applicant contends, "The Applicants use of a single flow of current to generate three voltage levels that define the data symbol is fundamentally excluded by Wilhelm's structure. Specifically, Wilhelm teaches a CML-type differential switching system (FIGS. 2-5) while the Applicants claim an LVDS-type signaling system. As a result, the number of bits claimed by the Wilhelm system is $\log_2(N_l!)$ (page 1, line 30) but the number of bits carried by the Applicants system is $\log_2(N_l(N_l-1))$. The Applicants submit that in Wilhelm the "inactive" signal is at level 0 while the two "active" signals are at levels 1 and 2; instead of the inactive signal providing "voltage unit 1" and the active signals providing "voltage units 0 and 2" as stated throughout the Office Action on pages 5-7 and 9. The Applicants respectfully traverse the statement in the Office Action (page 9) that the "use of a current signal versus a voltage signal is a design choice and does not change the functionality of the claims". The Applicants submit that the use of a single flow of current to generate the three different voltage levels used to define the data symbol is indeed important to the functionality of the claims. Wilhelm does not teach, and the Wilhelm system is not capable of, providing the advantageously claimed one pull-up current and one pulldown current. Moreover, the Office Action does not cite any authoritative source for its statement that the "use of a current signal versus a voltage signal is a design choice [that] does not change the functionalities of the claims" or the statement that "at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a current signal instead of a voltage signal source" for a complementary driver structure. Therefore, the Applicant respectfully asserts that Claim 1 is patentable over the patent granted to Wilhelm. Furthermore,

Claims 2-5, 7, and 29 are allowable for depending on allowable independent Claim 1 and in combination, including limitations not taught or described in the references of record."

The Examiner disagrees and asserts, that, the active and inactive signal voltage unit choices stated in the office action on pages 5-7 and 9 are strictly design choices and could be changed. Where Wilhelm may state that the inactive signal is at voltage unit 0 and the active signals at voltage levels 1 and 2, a design choice could state that the signal is an inactive signal of voltage unit 1 and active signals of voltage units 0 and 2. The voltage units could be set, by design, so that there are 3 voltage levels with the inactive level being substantially halfway between the first and second voltage levels with a current that is substantially zero. Therefore calling the signal at voltage unit 1 "inactive" and the signals at voltage levels 0 and 2 "active" does not change the function of the Wilhelm design.

The Examiner disagrees and reasserts, that, the use of a current signal versus a voltage signal is a design choice and does not change the functionality of the claims. It is inherent that when you have a current signal you have a voltage signal too. Wilhelm does teach, and the Wilhelm system is capable of, providing a pull-up current and pull down current as is seen in figure 1 and page 3, paragraph 2, lines 4-6, and table 4. Wilhelm does not expressly disclose a signal wherein one of the active signals is provided as a current of a first sense and the other active signal as a current of a second sense, the first and second sense being opposite to each other wherein the inactive signal has a current that is substantially zero. However, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use a current signal source instead of a voltage signal source being that it is inherent that a voltage is present when a current is present ad the use of the current signal would not change the

functionality. Having the active voltage levels at –n and +n with an inactive or intermediate level at zero would be the same as having a current of a first sense and the other active signal as a current of a second sense, the first and second sense being opposite to each other wherein the inactive signal has a current that is substantially zero. One of ordinary skill in the art would have been motivated to do this because use of a current signal versus a voltage signal is a design choice and does not change the functionalities of the claims.

Applicant states that the number of bits carried by the applicant's LVDS-type system is different from the number of bits carried by the Wilhelm CML-type system yet there is nothing claimed directed towards the system type or the number of bits carried therefore it is not considered in the patentability of the claims. Please direct all comments to the claims.

The Wilhelm patent was presented in the previous Office Action.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-5, 7, 14-20, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilhelm, UK 2,060,317 A.

Regarding claim 1, Wilhelm discloses a system (See figure 1, block SCN3) for transmitting symbols (see page 2, paragraph 4, lines 1-2) on a set of at least three terminals (See figure 1, lines where signals B31-B33 are transmitted), the system comprising for each symbol an active signal on two of those channels (See table 4, where an active signal provides voltage

units 0 and 2) and an inactive signal on the remaining channel or channels (See table 4, where an inactive signal provides voltage unit 1), the symbols being distinguishable by which two of the channels have the active signals (See figure 1 and table 4), wherein one of the active signals is provided as a current of a first sense and the other active signal as a current of a second sense, the first and second sense being opposite to each other. The primary reference teaches a voltage signal source instead of a current signal source, however, at the time the invention was made, it is well known and would have been obvious to a person of ordinary skill in the art to use a current signal source instead of a voltage signal source. Having the active voltage levels at –n and +n with an inactive or intermediate level at zero would be the same as having a current of a first sense and the other active signal as a current of a second sense, the first and second sense being opposite to each other wherein the inactive signal has a current that is substantially zero. One of ordinary skill in the art would have been motivated to do this because use of a current signal versus a voltage signal is a design choice and does not change the functionalities of the claims.

Regarding claim 2, Wilhelm discloses a system wherein the two active signals are of different form allowing them to be distinguished from each other (See figure 1 and page 3, paragraph 2, lines 4-6, and table 4, where an active signal provides voltage units 0 and 2 and an inactive signal provides voltage unit 1) the symbols being further distinguishable thereby.

Regarding claim 3, which inherits the limitations of claim 1, Wilhelm discloses a system wherein one of the active signals is an electrical signal at a first voltage level and the other is an electrical signal at a second voltage level. (See figure 1 and page 3, paragraph 2, lines 4-6, and

table 4, where an active signal provides voltage units 0 and 2 (different first and second active voltage levels) and an inactive signal provides voltage unit 1).

Regarding claim 4, which inherits the limitations of claim 3, Wilhelm discloses a system wherein the inactive signal or signals is an electrical signal at a voltage level intermediate to the first and second voltage levels (See figure 1 and page 3, paragraph 2, lines 4-6, and table 4, where an active signal provides voltage units 0 and 2 and an inactive signal provides voltage unit 1, where 1 is intermediate to 0 and 2).

Regarding claim 5, which inherits all of the limitations of claim 4, Wilhelm discloses a system wherein the inactive signal is at a voltage level substantially half-way between the first and second voltage levels (See figure 1 and page 3, paragraph 2, lines 4-6, and table 4, where an active signal provides voltage units 0 and 2 and an inactive signal provides voltage unit 1, where 1 is half-way between to 0 and 2).

Regarding claim 7, which inherits the limitations of claim 1, Wilhelm discloses a system (See figure 1, block SCN3) for transmitting symbols (see page 2, paragraph 4, lines 1-2) on a set of at least three terminals (See figure 1, blocks B31-B33), the system comprising for each symbol an active signal on two of those channels (See table 4, where an active signal provides voltage units 0 and 2) and an inactive signal on the remaining channel or channels (See table 4, where an inactive signal provides voltage unit 1), the symbols being distinguishable by which two of the channels have the active signals (See figure 1 and table 4) wherein one of the active signals is provided as a current of a first sense and the other active signal as a current of a second sense, the first and second sense being opposite to each other wherein the inactive signal has a current that is substantially zero. The primary reference teaches a voltage signal source instead

of a current signal source, however, at the time the invention was made, it is well known and would have been obvious to a person of ordinary skill in the art to use a current signal source instead of a voltage signal source. Having the active voltage levels at –n and +n with an inactive or intermediate level at zero would be the same as having a current of a first sense and the other active signal as a current of a second sense, the first and second sense being opposite to each other wherein the inactive signal has a current that is substantially zero. One of ordinary skill in the art would have been motivated to do this because use of a current signal versus a voltage signal is a design choice and does not change the functionalities of the claims.

Regarding claim 8, Wilhelm discloses an encoder (See figure 1, block SCN3) for transmitting data symbols (see page 2, paragraph 4, lines 1-2) from a set of at least three terminals (See figure 1, blocks B31-B33), the encoder being arranged to provide for each of the symbols an active signal on two of the terminals (See table 4, where an active signal provides voltage units 0 and 2) of the set while providing an inactive signal on the remaining terminal or terminals of the set (See table 4, where an inactive signal provides voltage unit 1), the encoder also being arranged to provide one of the active signals as a current of a first sense and the other active signal as a current of a second sense the first and second senses being opposite to one another. The primary reference teaches a voltage signal source instead of a current signal source, however, at the time the invention was made, it is well known and would have been obvious to a person of ordinary skill in the art to use a current signal source instead of a voltage signal source. Having the active voltage levels at –n and +n with an inactive or intermediate level at zero would be the same as having a current of a first sense and the other active signal as a current of a second sense, the first and second sense being opposite to each other wherein the inactive signal

has a current that is substantially zero. One of ordinary skill in the art would have been motivated to do this because use of a current signal versus a voltage signal is a design choice and does not change the functionalities of the claims.

Regarding claim 9, which inherits the limits of claim 8, Wilhelm discloses an encoder wherein the encoder is arranged to provide the two active signals in different form allowing them to be distinguished from each other (See figure 1 and page 3, paragraph 2, lines 4-6, and table 4, where an active signal provides voltage units 0 and 2 and an inactive signal provides voltage unit 1).

Regarding claim 10, which inherits the limitations of claim 9, Wilhelm discloses an encoder arranged to provide one of the active signals as an electrical signal at a first voltage level and the other active signal as an electrical signal at a second different voltage level. (See figure 1 and page 3, paragraph 2, lines 4-6, and table 4, where an active signal provides voltage units 0 and 2 (different first and second active voltage levels) and an inactive signal provides voltage unit 1).

Regarding claim 11, which inherits the limitations of claim 10, Wilhelm discloses an encoder arranged to provide the inactive signal or signals as an electrical signal at a voltage level intermediate to the first and second voltage levels of the active signals (See figure 1 and page 3, paragraph 2, lines 4-6, and table 4, where an active signal provides voltage units 0 and 2 and an inactive signal provides voltage unit 1, where 1 is intermediate to 0 and 2).

Regarding claim 12, which inherits all of the limitations of claim 11, Wilhelm discloses an encoder wherein the inactive signal is at a voltage level substantially half-way between the first and second voltage levels (See figure 1 and page 3, paragraph 2, lines 4-6, and table 4, where an

active signal provides voltage units 0 and 2 and an inactive signal provides voltage unit 1, where 1 is half-way between to 0 and 2).

Regarding claim 14, which inherit all of the limitations of claim 8, Wilhelm discloses an encoder wherein the encoder is arranged to provide the two active signals in different form allowing them to be distinguished from each other (See figure 1 and page 3, paragraph 2, lines 4-6, and table 4, where an active signal provides voltage units 0 and 2 and an inactive signal provides voltage unit 1). Wilhelm does not expressly disclose an encoder arranged to provide one of the active signals as current of a first sense and the other active signal as a current of a second sense, the first and second senses being opposite to one another wherein the inactive signal or signals are provided by not actively providing a current signal on the remaining terminal or terminals. The primary reference teaches a voltage signal source instead of a current signal source, however, at the time the invention was made, it is well known and would have been obvious to a person of ordinary skill in the art to use a current signal source instead of a voltage signal source. Having the active voltage levels at –n and +n with an inactive or intermediate level at zero would be the same as having active current levels that travel in opposite directions with an intermediate at the same, zero. One of ordinary skill in the art would have been motivated to do this because use of a current signal versus a voltage signal is a design choice and does not change the functionalities of the claims.

Regarding claim 15, which inherits the limitations of any one of claims 9 to 12 and 14, where only the limitations in regards to claim 9 are used for dependency, Wilhelm discloses an encoder (See figure 1, block SCN3) comprising first and second sets of switches (See figure 1, blocks GTS1-3: T1 and T2), one switch from each of the first and second sets being connected to

a respective one of the terminals (See figure 1, blocks GTS1-3: T1), the encoder being arranged to activate a selected one of the first set of switches in order to provide one of the active signals on the terminal to which that switch is connected and the encoder arranged to activate a selected one of the second set of switches in order to provide the other active signal on a terminal to which that switch is connected (See figure 1 and page 3, paragraph 2, lines 4-6, and table 4, where an active signal provides voltage units 0 and 2 and an inactive signal provides voltage unit 1).

Regarding claim 16, which inherits all of the limitations of claim 15, Wilhelm discloses an encoder wherein the remaining switches are inactive (which could be interpreted as voltage/current unit 0, where the voltage/current ranges from –n to +n) in order to provide an inactive signal on each remaining terminal.

Regarding claim 17, which inherits all of the limitations of claim 15 or claim 16, where only the limitations in regards to claim 15 are used for dependency, Wilhelm discloses an encoder wherein each switch in the first set of switches (See figure 1, blocks GTS1-3: T1 and B31-B33), is coupled to a first voltage level and each switch in the second set of switches is coupled to a second voltage level (See figure 1, blocks GTS1-3: T2 and VR).

Regarding claim 18, which inherits the limitations of claim 15 or claim 16, where only the limitations in regards to claim 15 are used for dependency, Wilhelm discloses an encoder wherein each switch in the first set of switches is coupled to a first source (See figure 1, blocks GTS1-3: T1 and B31-B33) and each switch in the second set of switches is coupled to a second source (See figure 1, blocks GTS1-3: T2 and VR). Wilhelm does not expressly teach that the source is a current source. The primary reference teaches a voltage signal source instead of a

current signal source, however, at the time the invention was made, it is well known and would have been obvious to a person of ordinary skill in the art to use a current signal source instead of a voltage signal source. Having the active voltage levels at –n and +n with an inactive or intermediate level at zero would be the same as having active current levels that travel in opposite directions with an intermediate at the same, zero. One of ordinary skill in the art would have been motivated to do this because use of a current signal versus a voltage signal is a design choice and does not change the functionalities of the claims.

Regarding claim 19, which inherits the limitations of any one of claims 15 to 18, where only the limitations in regards to claim 15 are used for dependency, prior art discloses an encoder wherein each terminal of the encoder is coupled, via a resistor (figures 1 and 2, blocks 7 and 8), to a common node (See figures 1 and 2, block 9 and page 1, lines 19-21).

Regarding claim 20, which inherits the limitations of claim 19, prior art discloses an encoder wherein the common node is at a/the voltage level intermediate to the voltage levels on the terminals carrying the first and second active signals (See figures 1 and 2, blocks 7-9 and page 1, lines 23-26).

Regarding claim 28, Wilhelm discloses a system comprising an encoder (See figure 1, block SCN3) for transmitting data symbols (see page 2, paragraph 4, lines 1-2) from a set of at least three terminals (See figure 1, blocks B31-B33), the encoder being arranged to provide for each of the symbols an active signal on two of the terminals (See table 4, where an active signal provides voltage units 0 and 2) of the set while providing an inactive signal on the remaining terminal or terminals of the set (See table 4, where an inactive signal provides voltage unit 1), the encoder also being arranged to provide one of the active signals as a current of a first sense and

the other active signal as a current of a second sense the first and second senses being opposite to one another. The primary reference teaches a voltage signal source instead of a current signal source, however, at the time the invention was made, it is well known and would have been obvious to a person of ordinary skill in the art to use a current signal source instead of a voltage signal source. Having the active voltage levels at –n and +n with an inactive or intermediate level at zero would be the same as having a current of a first sense and the other active signal as a current of a second sense, the first and second sense being opposite to each other wherein the inactive signal has a current that is substantially zero. One of ordinary skill in the art would have been motivated to do this because use of a current signal versus a voltage signal is a design choice and does not change the functionalities of the claims; and a decoder (See figure 2, block ECN3) for receiving data symbols presented at a set of at least three terminals (See figure 2), the decoder being arranged to detect which two of the terminals have an active signal and to identify in response which symbol is being received (See page 3, lines 25-41).

Regarding claim 29, Wilhelm discloses a method of transmitting data comprising encoding it as a series of symbols using the signal in any one of claims 1 to 7, where only the limitations in regards to claim 1 are used for dependency. (See figure 1 and rejection of claims 1 and 8).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Abramson et al, US Patent No. 5,635,862 discloses a high-speed block encoder circuit.

Nishida, US Patent No. 6,229,472 discloses an A/D converter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krista M. Flanagan whose telephone number is (571) 272-2203. The examiner can normally be reached on Monday - Friday, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad H. Ghayour can be reached on (571) 272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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